MS APPEAL BRIEF - PATENTS
Docket No.: 1381-0307P
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Jyrki LAAKSONHEIMO

Application No.: 10/756,380 Confirmation No.: 2366

Filed: January 14, 2004 Art Unit: 2837

For: METHOD FOR CORRECTING SPEED FEEDBACK IN A PERMANENT-MAGNET MOTOR Examiner: T. W. Smith

APPEAL BRIEF TRANSMITTAL FORM

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Transmitted herewith is an Appeal Brief on behalf of the Appellant in connection with the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

A Notice of Appeal was filed on April 18, 2005.

☐ Applicant claims small entity status in accordance with 37 C.F.R. § 1.27.

The fee has been calculated as shown below:

☒ Extension of time fee pursuant to 37 C.F.R. §§ 1.17 and 1.136(a) - $$1,020.00.

☒ Fee for filing an Appeal Brief - $500.00 (large entity).

☒ A check in the amount of $1,520.00 is attached.

☐ Please charge Deposit Account No. 02-2448 in the amount of $$1,520.00. A triplicate copy of this sheet is attached.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: September 19, 2005 (Monday)

Respectfully submitted,

By _____

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Attachments

MKM/MRG/tm

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APPEAL BRIEF

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Sir:

As required under § 41.37(a), this brief is filed more than two months after the Notice of Appeal filed in this case on April 18, 2005, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

The real party in interest in the present Appeal is the assignee of the present application, namely, Kone Corporation of Finland.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

Appellant respectfully submits that no other Appeals or Interferences are known to Appellant, Appellant's legal representative, or the Assignee of the present application, which would directly affect or be directly affected by or having a bearing on the Board's decision in the pending Appeal.

III. STATUS OF CLAIMS

Claims 1-9 are pending in the subject application, with claims 1 and 9 being independent. Claims 1-9 have been rejected. Specifically, in a Final Office Action dated November 18, 2004 claims 1, 4-6 and 9 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement, and claims 1-3 and 7-9 were rejected under 35 U.S.C. §103(a).[1]

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[1] In an Interview Summary dated September 1, 2005, the Examiner indicated that the 35 U.S.C. §112, second paragraph, rejections would be withdrawn. The Examiner has apparently made a typographical error and intended to

Because the 35 U.S.C. §112, first paragraph, rejection has been withdrawn, dependent claims 4-6 are presumed to be allowable over the art of record.

IV. STATUS OF AMENDMENTS

Applicant filed a Reply After Final Rejection on February 18, 2005. There were no amendments made to the claims in this Reply. Attached to the Reply was a second substitute specification, whereby the specification was amended to clarify features that are well known to one skilled in the art, in an effort to further the Examiner's understanding of the subject application. The Examiner responded to the Amendment After Final Rejection in an Advisory Action mailed April 5, 2005. The Examiner also noted in an Interview Summary dated September 1, 2005, that the second substitute specification is entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention provides a method and apparatus for correcting speed feedback in a motor.

A problem in the prior art is that speed feedback in a synchronous permanent magnet motor changes, e.g., as a function of temperature. When used as, for example, an elevator drive machine, the permanent magnet motor is typically subjected to long-lasting peak-level loads,

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state that the 35 U.S.C. §112, *first* paragraph, rejections are withdrawn since this is the only section 112 rejection at issue in the present application .

during which the temperature of the elevator machine rises. As the machine develops heat, the speed feedback sensor attached to the machine becomes heated. Thus, the speed information obtained from the tachometer changes, e.g. drifts, as a function of the temperature of the machine. This occurs over a relatively long period of time.

When using a tachometer as a servomotor feedback sensor in, for example, elevator systems, there may be up to a 10% error (drift) in a tachometer output signal, mainly because of tachometer gain drift. Both offset drift and gain drift may increase or decrease the tachometer signal (positive or negative drift), this behavior depends on tachometer construction, manufacturing processes, usage, etc. Figs. 3a and 3b illustrate an effect of offset drift and gain drift on a sensor output signal. If drift errors are not compensated, the elevator may run slower than designed, creating problems when stopping at floor stops due to oscillations in an elevator drive motor rotation speed or the like.

Accordingly, a preferred embodiment of the present invention is directed to a method and apparatus for correcting the drift of speed feedback in the measurement of the speed of a synchronous permanent-magnet motor. See paragraph 11 of the second substitute specification.[2]

Fig. 2 illustrates a flow chart of an embodiment of the present invention. In step S1 averages of a speed reference and speed measurement for downward travel are calculated. In step S3 averages of a speed reference and speed measurement for upward travel are calculated. Then, in step S5, the gain and zero factors are identified. Thereafter, in step S7, the measured speed

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[2] In an Interview Summary dated September 1, 2005, the Examiner clearly indicated that the second substitute specification is entered.

value is corrected on the basis of the identified gain and zero factors, to compensate for drift in the feedback sensor. See paragraph 13 and 28 of the second substitute specification.

The averages of speeds are calculated using the sum of the respective speeds and the number of samples. For example, the average of the speeds of downward constant-speed travel is calculated by dividing the sum of the speeds of constant-speed downward travel by the number of samples of downward constant speed. Similarly, the average of the speeds of constant-speed upward travel is calculated by dividing the sum of the speeds of constant-speed upward travel by the number of samples of upward constant speed. See paragraph 14 of the second substitute specification.

In a further embodiment, the speed gain factor and speed zero factor are updated by a forgetting factor. This forgetting factor is a factor, such as an exponential factor, and is used so that, by applying the forgetting factor, measurement samples of recent history are given more weight as compared with earlier measurement samples. In other words, the forgetting factor is a weighting coefficient that defines how much old data and how much new data are used for calculating a new value for the speed gain factor or the speed zero factor. See paragraphs 17-18 of the second substitute specification.

VI. ISSUES

Whether claims 1-3 and 7-9 are patentable over Murakami et al. (US 4,914,365) in view of Hakala et al. (WO 99/28229).

VII. GROUPING OF CLAIMS

Each of claims 1-3 and 7-9 are grouped separately and do not stand or fall together. Pursuant to 37 C.F.R. §1.192(c)(7), arguments are presented herein below as to why the claims are separately patentable.[3]

VIII. ARGUMENT

A. Claim 1 is patentable over the cited art.

The combination of the cited art fails to teach or suggest a method for correcting speed feedback in a motor, whereby a measured speed value is corrected in order to compensate for drift in the feedback sensor so that an elevator does not run slower than designed, the elevator will not have problems for stopping at floor stops, to prevent oscillations in the elevator drive motor rotation speed, etc.

The Examiner purports that the combination of Murakami et al. with Hakala et al. supposedly teach the features of independent claim 1. The Examiner, however, failed to discharge his burden in establishing a prima facie case of obviousness for at least the following reasons.

To establish a *prima facie* case of obviousness, three basic criteria must be met: (1) there must be some suggestion of motivation, either in the references themselves or in the knowledge

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[3] Appellant did not include claims 4-6 with the claims at issue because, as noted hereinabove, claims 4-6 are considered to be allowable because the §112 rejection has been withdrawn and these claims were not rejected under any cited art.

generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference must teach or suggest all the claim limitations, *see In re Vaeck*, 947 F.2d 48, 20 USPQ2d 1438 (Fed.Cir.1991).

Murakami et al. is directed to a servo motor controller for robots in order to compensate vibrations of a robot arm when running the robot with different speeds, loads, etc. Murakami et al. teaches, with reference to Fig. 1, that an adder 1 calculates a deviation Δw between an objective rotational speed value w^* and a measured speed value w_m of a servo motor 14. In the position control device 2, the deviation obtained by the adder 1 is integrated to obtain a position deviation that is multiplied with a suitable gain K_i to obtain a rotational speed reference value of the servo motor 14. Then, in order to compensate for response delay of the position control device 2, a correction amount w_f for the reference value w_i of rotational speed of the servo motor is obtained. See col. 2, lines 37 to 52, of Murakami et al.

Murakami et al., however, contains absolutely no teaching that drift errors are compensated for the measured speed value w_m. This is readily apparent from Fig. 1 of Murakami et al. because the uncompensated signal w_m is connected to the point 9 and to the box 11 (damper element) directly without any drift compensation. In other words, Murakami et al. only compensates for response delay and does not compensate for drift in a feedback sensor.

In an Advisory Action dated April 5, 2005, the Examiner concludes that it is the Examiner's belief "that if [the cited art can determine] the averages of a speed reference and speed measurement, identifying gain and zero factors, correcting the measured speed value [then] any drift in the feedback sensor can be corrected." In other words, it appears that the

Examiner is alleging that because the cited art supposedly performs some features of the claim, then it must also correct a measured speed value to compensate for drift in the feedback sensor. Such a conclusionary statement, however, is improper in order to substantiate a *prima facie* case of obviousness. The Examiner "cannot rely on conclusionary statements when dealing with particular combinations of prior art and specific claims." *In re Lee*, 61 USPQ2d 1430, 1434 (Fed. Cir.).

Lastly, Appellant notes that the Examiner merely cited Hakala, which is assigned to Appellant, to teach an elevator control system for a synchronous motor, and therefore, no further comments are needed with respect to Hakala.

Thus, in view of the above comments, it is clearly evident that the cited art does not teach or suggest the features of at least independent claim 1, and therefore, a *prima facie* case of obviousness cannot be substantiated. Accordingly, it is respectfully requested that the Board dismiss the Examiner's rejections.

B. **Independent Claim 9 is patentable over the cited art.**

Independent claim 9 is patentable over the combination of Murakami et al. with Hakala et al. for at least the reasons presented above in addition to the comments provided further below.

Independent claim 9 is separately patentable from claim 1, because claim 9, in contrast to claim 1, compensates drift on the basis of an average of a speed reference, an average of a speed measurement, an identified gain factor, an identified zero factor, and on the basis of a forgetting factor.

In rejecting independent claim 9, the Examiner completely failed to consider the feature of a "forgetting factor" as recited in independent claim 9. Appellant respectfully submits that Murakami et al. provides absolutely no teaching of a correcting unit for compensating a drift in a measuring unit, whereby the drift is compensated on the basis of an average of a speed reference, an average of a speed measurement, an identified gain factor, an identified zero factor, and on the basis of a forgetting factor. The Examiner, as alluded to above, completely disregarded this feature as is evidenced in the Office Action because the Examiner failed to even identify this feature in his rejection.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Appellant would also like to reiterate that with respect to independent claim 9, the Examiner also merely cited Hakala to teach an elevator control system for a synchronous motor, and therefore, no further comments are needed with respect to Hakala.

Thus, the cited art does not teach or suggest all of the features of claim 9, and therefore, a *prima facie* case of obviousness cannot be substantiated. Accordingly, it is respectfully requested that the Board dismiss the Examiner's rejections.

C. Dependent claims 2-3 and 7-8 are patentable over the cited art.

If an independent claim is nonobvious under 35 U.S.C. §103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Thus,

dependent claims 2-3 and 7-8 are allowable at least because they depend from independent claim 1, in addition to the following separately patentable recited features.

Claim 2 calculates the averages of speed reference and speed measurement using a sum of the speed values and a total number of samples of the speed values, whereby the speed reference and speed values are measured and calculated, respectively, in accordance with the method steps of claim 1. Claim 3 identifies the gain factor and zero factor each time the averages of speed reference and speed measurement are calculated. Claim 7 further reiterates that the method is adaptive and claim 8 specifies that the synchronous permanent-magnet motor is an elevator drive machine.

The cited art, however, completely fails to teach any of these separately patentable features. Furthermore, the Examiner also failed to provide any comments as to how the cited art supposedly teaches these features. Thus, dependent claims 2-3 and 7-8 are allowable over the cited art.

IX. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A. As indicated above, the claims in Appendix A include the amendments filed by Applicant on August 23, 2004.

X. EVIDENCE

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

XI. CONCLUSION

For at least the reasons advanced hereinabove, it is submitted that the rejections of all claims pending in this application should be reversed.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Dated: September 19, 2005

Respectfully submitted,

By _____

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APPENDIX A

Claims Involved in the Appeal of Application Serial No. 10/756,380

1. A method for correcting speed feedback in a synchronous permanent-magnet motor, the steps comprising:

measuring a speed value of the synchronous permanent-magnet motor by a feedback sensor;

calculating averages of a speed reference and a speed measurement for downward and upward constant-speed travel;

identifying gain and zero factors; and

correcting the measured speed value to compensate for drift in the feedback sensor.

2. The method according to claim 1, wherein the averages of speed reference and speed measurement are calculated using a sum of the speed values and a total number of samples of the speed values.

3. The method according to claim 2, wherein the gain factor and zero factor are identified each time the averages of speed reference and speed measurement are calculated.

4. The method according to claim 3, wherein the gain factor and zero factor are updated by a forgetting factor.

5. The method according to claim 3, wherein the gain factor and zero factor are updated by an exponential forgetting factor.

6. The method according to claim 4, wherein, by applying the forgetting factor, measurement samples of recent history are weighted greater than earlier measurement samples.

7. The method according to claim 1, wherein the method is adaptive.

8. The method according to claim 1, wherein the synchronous permanent-magnet motor is an elevator drive machine.

9. An apparatus for correcting measured speed feedback, the apparatus comprising:

a measuring unit for measuring a speed value of a synchronous permanent-magnet motor;

a calculating unit for calculating averages of a speed reference and a speed measurement from the measured speed value;

an identifying unit for identifying a gain factor and a zero factor; and

a correcting unit for compensating a drift in the measuring unit, the correcting unit compensating for the drift on the basis of the average of the speed reference, the average of the speed measurement, the identified gain factor, the identified zero factor, and on the basis of a forgetting factor.